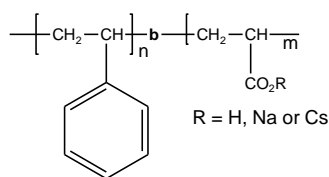


Sample Name: Poly(styrene -b- acrylic acid)

Sample #: P4122-SAA

Structure:

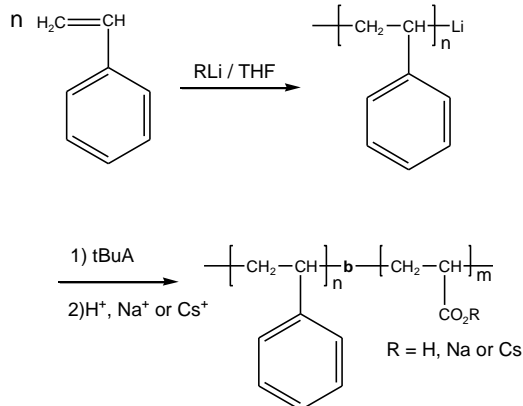


Composition:

Mn × 10 ³ PS-b-PAA	PDI
2.2-b-7.0	1.25
T _g for PS block: Not distinct	T _g for AA block: 115°C

Synthesis Procedure:

Poly(styrene-b-acrylic acid) is prepared by living anionic polymerization with sequence addition of styrene followed by t-butyl acrylate and hydrolysis of the t-butyl group. The scheme of the reaction is illustrated below:



Characterization:

An aliquot of the polystyrene block was terminated before addition of t-butyl acrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The hydrolysis of the tert. butyl ester to acid was followed by FT-IR spectroscopy by disappearance of characteristic absorbance at 1362cm⁻¹ of tert.butyl group.

Thermal analysis of the sample:

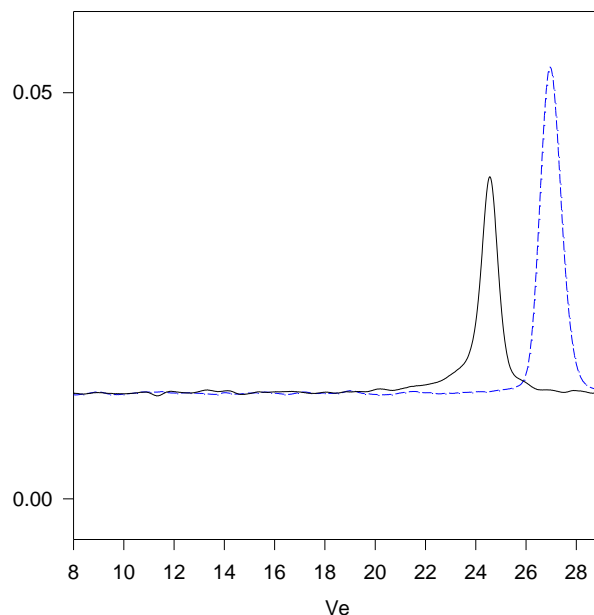
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

Poly(styrene-b-acrylic acid) is soluble in THF, dioxane and also in methanol (depending on the compositions with a short segment of polystyrene with long segment of poly acrylic acid). The polymers is precipitated out from ether, hexane.

SEC of the block copolymer:

SEC of PStBuA(precursor of P4122-SAA)



Size Exclusion Chromatography :

--- Polystyrene, M_n=2200, M_w=2400, M_w/M_n=1.06

— Block Copolymer PS(2200)-b-PtBuA(12500), M_w/M_n=1.25

Block Copolymer in acid form: PS(2200)-b-PAA(7000), M_w/M_n=1.25

DSC thermogram for the polymer:

